Key Questions for Upright MRI Draft 1

Teleconference held on February 5, 2007 by Dr. David Flum. Participants included Dr. Bob Mootz, Leah Hole-Curry and Dr. Jerry Jarvik.

Topic: New technology allows for upright, standing and weight-bearing MR imaging in various positions. This technology is being promoted as a superior alternative to traditional MRI (supine) especially to more definitively find pathology causing back pain. Positional, weight-bearing MRIs are marketed and/or ordered to include multiple images (various positioning, such as flexion and extension). The rationale for such additional views is to determine if disc pathology (degeneration, protrusion, instability) is present at multiple levels. Proponents report that weight-bearing MRI can find more "pathology" than recumbent studies. MRI centers are frequently willing to discount costs of the additional views.

Discussion: Technology is starting to diffuse, cost is higher than supine MR imaging, with unclear efficacy related to improved diagnostic and outcomes. Also concerned about the potential for more findings related to multiple images/positions that may result in additional testing and unnecessary surgical procedures; what is accuracy.

Primary question is not whether the test yields more "anatomic findings" but whether those are meaningful – do they correlate to symptoms; are they predictive/useful in therapy; predictive of clinical condition; or other therapeutic impact.

Intervention/Comparator: The defining characteristic of this type of MR is not that the machine is "upright" but that it images weight bearing or "loaded" joints or anatomy as opposed to standard "supine" MR imagining. The theory is that "loading" (e.g. of spinal discs) produces anatomic changes and that these changes will provide meaningful diagnostic information. Methods also exist to apply axial compressive loads in recumbent studies as well.

Population/Condition: Is there a specific population for which diagnostic yield of axially loaded MRI studies would be clinically helpful, eg, patients with radicular pain/joint pain/ spine pain? Looking at this specific to spinal conditions – discussion on whether to include other conditions (e.g. hip or knee). We discussed the tension between desire to get the broadest "coverage" answer possible with need to be specific and have questions that a Tech assessment can answer effectively. Specific spinal conditions listed.

Outcomes: Question and discussion about "will anatomic findings on upright MRI be related to clinical conditions or point patients to therapy more efficiently/effectively are mostly covered in 3 and 4. We agreed safety, per se, was not a relevant domain for evidence generation for this dx test but should be considered as a "downstream issue (along with downstream costs)" by the committee (eg, the likelihood of additional anatomic findings leading to additional studies, ineffective or harmful treatment).

Safety – primary safety concern is addressed in the outcomes/efficacy issue related to indirect safety concern if improper diagnosis or treatment results more often from this test. Likely doesn't need further key question, but report should include in description of technology the typical radiation differentials between standard MR and this one. Unlikely that there are additional risks beyond conventional MRI (like missing metallic implants, etc) Also what about load on injured or pain area (seems minimal)? How do you address interpretation issues?

Cost – cost effectiveness data is not likely and difficult to define for this diagnostic where efficacy is unclear; straight cost information on charges can be included. Cost per QALY not likely to be determined from existing evidence. May want to report on CPT code (are there any new codes for this test specifically so that costs could be measured. No specific codes exist for this just regular MRI codes).

Draft Questions:

1. What is the evidence to describe the accuracy (i.e ability to detect known conditions) of upright MRI compared to currently available dx testing (i.e standard MRI +/- loading, CT myelogram, plain films[flexion and extension]) in patients with;
    a. suspected degenerative spondylolisthesis
    b. suspected spinal stenosis
    c. radicular pain
    d. non-specific spin pain
    e. extra-spinal joint pain/function loss

2. What is the evidence to describe the reliability (i.e test-retest, intra-reader, inter-reader performance) of upright MRI compared to available dx testing in patients with a-e;

3. What is the evidence to describe the diagnostic impact (i.e effect on additional dx testing, effect on limiting the differential dx) of upright MRI compared to available dx testing in patients with a-e;

4. What is the evidence to describe the therapeutic impact (i.e effect on treatments received, efficiency of moving from dx testing to treatment, outcomes of test-directed treatment) of upright MRI compared to available dx testing in patients with a-e

5. What is the evidence that upright MRI in the acute setting is more effective (diagnostic and therapeutic impact) than available dx testing in the sub-acute/delayed setting in patients with a-e

6. What is the evidence to support the cost impact of upright MRI-(i.e per patient costs, and total costs if upright MRI replaced standard MRI for dx testing in patients undergoing MRI for spin related conditions-based on number of spine MRIs in 2006, technical and professional costs, including downstream diagnostic and therapeutic costs)